

What is claimed is:

1. A substantially pure HLA pan DR-binding peptide comprising a fragment of a stress protein that binds to one or more MHC class II molecules.
2. The substantially pure peptide of claim 1, wherein the peptide binds to HLADR1, DR4, and DR7.
3. The substantially pure peptide of claim 1, wherein the peptide comprises an amino acid sequence that is conserved between human and bacterial heat shock proteins.
4. The substantially pure peptide of claim 1, wherein the peptide comprises an amino acid sequence that is conserved between human and mycobacterial proteins.
5. The substantially pure peptide of claim 1, wherein the peptide is at least 70% identical to a sequence as set forth in SEQ ID Nos: 2, 3, 4, 5, 6, 7, 8, 9 or 10.
6. The substantially pure peptide of claim 5, wherein the peptide is at least 80% identical to a sequence as set forth in SEQ ID Nos: 2, 3, 4, 5, 6, 7, 8, 9 or 10.
7. The substantially pure peptide of claim 5, wherein the peptide is at least 90% identical to a sequence as set forth in SEQ ID Nos: 2, 3, 4, 5, 6, 7, 8, 9 or 10.
8. The substantially pure peptide of claim 5, wherein the peptide is at least 95% identical to a sequence as set forth in SEQ ID Nos: 2, 3, 4, 5, 6, 7, 8, 9 or 10.
9. The substantially pure peptide of claim 5, wherein the peptide has a sequence as set forth in SEQ ID Nos: 2, 3, 4, 5, 6, 7, 8, 9 or 10.
10. The substantially pure peptide of claim 1, wherein the stress protein is a heat shock protein.
11. The substantially pure peptide of claim 10, wherein the heat shock protein is a bacterial heat shock protein.

12. The substantially pure peptide of claim 10, wherein the heat shock protein is a mycobacterium species heat shock protein.

13. The substantially pure peptide of claim 12, wherein the mycobacterium species heat shock protein is hsp65 or hsp60.

14. The substantially pure peptide of claim 10, wherein the heat shock protein is a mammalian heat shock protein.

15. The substantially pure peptide of claim 14, wherein the mammalian heat shock protein is a human heat shock protein.

16. The substantially pure peptide of claim 15, wherein the human heat shock protein is human hsp60.

17. The substantially pure peptide of claim 1, wherein the fragment is about 10 to 30 amino acids in length.

18. The substantially pure peptide of claim 17, wherein the fragment is about 15 to 25 amino acids in length.

19. The substantially pure peptide of claim 17, wherein the fragment is about 15 to 20 amino acids in length.

20. The substantially pure peptide of claim 1, wherein the peptide has one or more D-amino acids.

21. The substantially pure peptide of claim 5, wherein one or more amino acid of SEQ ID Nos: 2, 3, 4, 5, 6, 7, 8, 9 or 10 has been substituted by one or more amino acid having a similar size, charge and polarity.

22. The substantially pure peptide of claim 1, wherein the peptide is covalently linked to an adjuvant.

23. The substantially pure peptide of claim 22, wherein the adjuvant is keyhole limpet hemocyanin, bovine serum albumin, human serum albumin or isologous IgG.

24. A pharmaceutical composition, comprising a peptide of claim 1 in a pharmaceutically acceptable carrier.

25. An isolated nucleic acid sequence encoding a peptide of claim 1.

26. The nucleic acid sequence of claim 25, wherein the sequence encodes a peptide having a sequence as set forth in SEQ ID Nos:2, 3, 4, 5, 6, 7, 8, 9 or 10.

27. The isolated nucleic acid sequence of claim 26, wherein T can be U or complementary sequences of the foregoing and sequences that are 15-20 nucleotides in length that specifically hybridize to a nucleic acid sequence encoding a peptide having a sequence as set forth in SEQ ID Nos: 2, 3, 4, 5, 6, 7, 8, 9 or 10.

28. An antibody which specifically binds to the peptide of claim 1.

29. The antibody of claim 28, wherein the antibody is a monoclonal antibody.

30. The method of claim 28, wherein the antibody is formulated in a pharmaceutically acceptable carrier.

31. An expression vector containing in operable linkage a nucleic acid sequence of claim 25, 26 or 27.

32. A host cell containing the vector of claim 31.

33. An immunomodulating composition for use in treating or preventing an inflammatory disorder comprising a substantially pure peptide comprising a fragment of a stress protein that binds to one or more MHC class II molecules in a pharmaceutically acceptable carrier.

34. The immunomodulating composition of claim 33, wherein the fragment binds to HLA DR1, DR4 and DR7.

35. The composition of claim 34, wherein the inflammatory disorder is an immune-mediated disease.

36. The composition of claim 34, wherein the immune-mediated disease is an autoimmune disease.

37. The composition of claim 34, wherein the immune-mediated disease is selected from the group consisting of multiple sclerosis (MS), rheumatoid arthritis, lupus erythematosis, type I diabetes, scleroderma, myastenia gravis and ulcerative colitis.

38. The composition of claim 34, wherein the substantially pure peptide has a sequence as set forth in SEQ ID Nos:2, 3, 4, 5, 6, 7, 8, 9 or 10.

39. The composition of claim 34, further comprising a biological response modifier.

40. The composition of claim 39, wherein the biological response modifier is selected from the group consisting of a cytokine, a chemokine, a hormone, a steroid and an interleukin.

41. The composition of claim 40, wherein the biological response modifier is an interferon.

42. The composition of claim 39, wherein the biological response modifier is selected from the group consisting of IL-1(α or β), IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-11, IL-12, GM-CSF, M-CSF, G-CSF, LIF, LT, TGF- β , γ -IFN, TNF- α , BCGF, CD2, or ICAM.

43. A method for treating or preventing an immune-mediated disease in a subject having or at risk of having the disease comprising administering to the subject, an effective amount of a substantially pure peptide comprising a fragment of a stress protein that binds to MHC class II molecules in a pharmaceutically acceptable carrier, wherein the peptide modulates an immune response, thereby treating or preventing the disease.

44. The method of claim 43, wherein the subject is a mammal.

45. The method of claim 44, wherein the mammal is a human.

46. The method of claim 43, wherein the immune-mediated disease is an autoimmune disease.

47. The method of claim 43, wherein the immune-mediated disease is selected from the group consisting of multiple sclerosis (MS), rheumatoid arthritis, lupus erythematosis, type I diabetes, scleroderma, myastenia gravis and ulcerative colitis.

48. The method of claim 43, wherein the immune-mediated disease is a cancer.

49. The method of claim 43 wherein the cancer is selected from the group consisting of melanoma, leukemia, lymphoma, lung, liver, kidney, brain, bladder solid tumors, retinoblastoma, sarcoma and connective tissue cancers.

50. The method of claim 43, wherein the immune-mediated disease is an infectious disease.

51. The method of claim 43, wherein the substantially pure peptide has a sequence as set forth in SEQ ID Nos:2, 3, 4, 5, 6, 7, 8, 9 or 10.

52. The method for modulating an immune response in a subject comprising administering to the subject, an effective amount of a substantially pure HLA pan DR-binding peptide comprising a fragment of a stress protein that binds to one or more MHC class II molecules.

53. The method of claim 52, wherein the fragment binds to HLADR1, DR4 and DR7.

54. The method of claim 52, wherein the subject is a mammal.

55. The method of claim 54, wherein the mammal is a human.

56. The method of claim 52, wherein the immune response is associated with an immune-mediated disease is selected from the group consisting of multiple sclerosis (MS), rheumatoid arthritis, lupus erythematosis, type I diabetes, scleroderma, myastenia gravis and ulcerative colitis.

57. The method of claim 52, wherein the immune response is associated with an infectious disease.

58. The method of claim 52, wherein the immune response is associated with an immune-mediated cancer selected from the group consisting of melanoma, leukemia, lymphoma, lung, liver, kidney, brain, and bladder solid tumors, retinoblastoma, sarcoma, and connective tissue cancers.

59. The method of claim 52, wherein the substantially pure peptide has a sequence as set forth in SEQ ID NOS:2, 3, 4, 5, 6, 7, 8, 9 or 10.